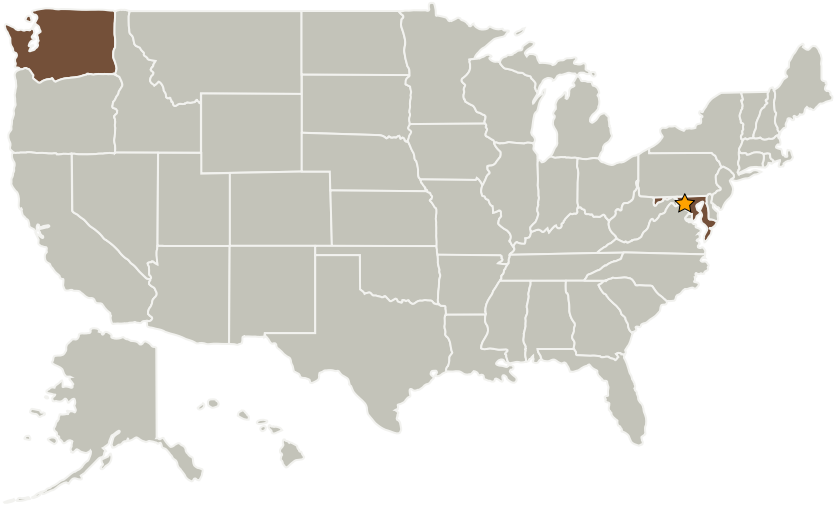
Blocking Filters with Enhanced Throughput for X-Ray Microcalorimetry, Phase II

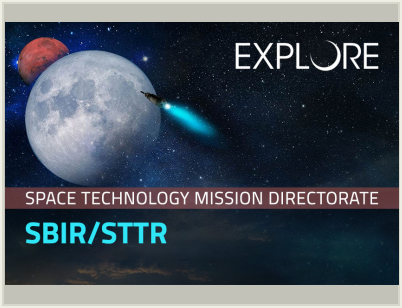
Completed Technology Project (2009 - 2011)

Project Introduction

NASA will fly x-ray microcalorimeters on several mission payloads scheduled within the next 5 years: New and improved IR/Visible blocking filters are urgently needed to realize the full potential and throughput of these missions. The innovation proposed, high transmission polyimide support mesh, will replace the nickel mesh used in previous blocking filter designs. Polyimide's composition affords high transparency to x-rays, especially above 3 keV. Phase 1 prototypes demonstrated 11-15% higher transmission than comparable nickel mesh across the UV-Visible-NIR range. With development of the Phase 1 process in Phase 2, the mesh will be optimized for strength, transmission, integration with filter materials, and filter lifetime; it will include deicing capability as required. Lithographic production means adaptability to meet future mission-specific filter performance requirements. The Phase 2 project will achieve a flight readiness level of 5-6 for blocking filters using the new mesh. Phase 1 results show that with successful process development, the proposed high transmission polyimide mesh will significantly improve mission throughput and effective area for microcalorimeter payloads on proposed NASA missions such as Spectrum-X-Gamma and NeXT in the near term as well as Constellation-X.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Goddard Space Flight Center (GSFC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland
Luxel Corporation	Supporting Organization	Industry Small Disadvantaged Business (SDB)	Friday Harbor, Washington

Primary U.S. Work Locations	
Maryland	Washington

Project Transitions

March 2009: Project Start

March 2011: Closed out

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.1 Detectors and Focal Planes